ON A FIDDLER (*TRYGONORHINA FASCIATA*), WITH ABNORMAL PECTORAL FINS.

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(Plate xx.)

Some little time ago there came into my possession through the kindness of Mr. J. Hastie, Broken Bay, N.S.W., a specimen of the Fiddler-ray (*Trygonorhina fasciata*), with markedly abnormal pectoral fins. The specimen presented so peculiar and striking an appearance that it was picked out by the fishermen when looking over the contents of their net after a haul and kept as a curiosity. On describing the specimen to my friend, Prof. G. B. Howes, he referred me to a note* by Dr. Traquair on an abnormal Thornback (*Raia clavata*). Dr. Traquair very kindly furnished me with a copy of his note, and I am now enabled to give a description of this specimen.

The Fiddler in question is a young male, measuring 26·9 cm. in length, and 11·2 cm. across the broadest part of the pectoral fins.

From the illustration accompanying this note it will be seen that the pectoral fins are markedly abnormal, and give the fish a very striking appearance. On each side the anterior portion of each pectoral fin is separated by a wide and deep notch from the head. The notch on the left side is, as in Dr. Traquair's Thornback, deeper than that on the right, causing the animal to have a very asymmetrical appearance. On the right side the notch extends backwards from the anterior end of the pectoral fin for a distance of 3 cm., and terminates almost on a level with the posterior border of the spiracular cleft. On the left side, however, the notch extends back for a distance of 4·5 cm., terminating at

* Note on an abnormally developed Thornback (*Raia clavata*), Ann. of Scottish Nat. Hist. Jan., 1892.

the point of articulation of the propterygium with the shoulder girdle. The entire anterior portion of the left fin, supported by the propterygium and its rays, is thus entirely free from the body. On both sides, and especially on the left, the propterygia are directed markedly outwards.

The only parallel for this condition among living Elasmobranchs appears to be found in the Angel-fish (*Rhina squatina*). In that form, as is well known, the anterior ends of the expanded pectoral fins extend forward as two short horns supported by the propterygia, and entirely free from the body wall. On the left side of our specimen, except for the greater forward extension of the fin, the condition in *Rhina* is essentially realised.

In the abnormal Thornback described by Dr. Traquair the anterior extremities of the pectoral fins projected as two short processes, one on either side of the snout. I have found a similar condition in one of a series of twelve young taken from a single female *Hypnos subnigrum*. In this specimen, which measured 6·1 cm. in length, the anterior ends of the pectoral fins projected as two blunt horns, one on the outer side of the anterior portion of each electric organ.

Similar cases of the non-adherence of the anterior extremities of the pectoral fins to the head have been recorded by Yarrell* for *Raia clavata*, by Day† for *R. clavata* and *R. batis*, and by Bureau‡ for *R. asterias*. All these cases are of the same nature, and of all recorded instances of this abnormality that of the *Trygonorhina* herein described is perhaps the most marked. The meaning of this variation, to which some slight importance may be attached from its occurrence in three distinct Batoid genera, is not far to seek. Prof. Howes, in his paper§ on the fin-skeleton

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* Yarrell. British Fishes, ed. by Richardson, 1859, Vol. ii. p. 585 and p. 384.

† Day. British Fishes, Vol. ii. p. 345, Pl. CLXXI. fig. 2, and p. 337.

‡ Bureau. Bull. Soc. Zool. France, 1889, xiv. p. 313, and fig. (References from Bateson. Materials for the Study of Variation, p. 540.)

§ Observations on the Pectoral Fin-skeleton of Batoid Fishes. P.Z.S. 1890, p. 680.

of Batoids, says "that the Batoid type of fin has been derived from a shorter Selachoid one by forward rotation and general enlargement is sufficiently clear from known facts of development.' It is in these facts, viz., that the pectoral fin of Batoids undergoes a forward growth in the embryo and only secondarily fuses with the cephalic integument, that these cases of non-adherence in the young or adult find their explanation. This is fully borne out by the examination of a uterine embryo of *Urolophus testaceus*, 3 cm. in length, in the teaching collection of the Biological Department of this University. In this embryo in which distinct external gills are present and the cranial flexure is well marked, the broadly expanded pectoral fins extend forward beyond the mouth as two blunt processes separated by a cleft from the head, and are at this stage comparable with the adult condition of the pectoral fins in *Rhina*.

From these facts of development we are led to regard the non-adherence of the anterior portions of the pectoral fins in *Trygonorhina* and the incomplete adherence of the anterior ends of the fins in the other recorded cases as retentions more or less complete of an embryonic or ancestral condition—as reversions in fact, for if there is any truth at all in the law of recapitulation there can be little doubt but that the free condition of the anterior portion of the pectoral fin of Batoids was the primitive one. It is interesting in view of this to find this feature of non-adherence most marked in the Rhinobatid genus *Trygonorhina*, the Rhinobatids being in many points transitional between the *Batoidei* and *Selachoidei*.

In conclusion I have to express my indebtedness to Mr. Robert Grant for the photograph from which the accompanying drawing was made.

EXPLANATION OF PLATE.

Dorsal aspect of an abnormal specimen of *Trygonorhina fasciata*—reduced about $2\frac{1}{8}$ times.